

OVERHAULING BRAKE CALIPERS GUIDE

by Mr. Stefnwolf

This guide is for a 1982 GSX750ET but I expect most of the GS series to be similar if not the same.

Badly corroded calipers (caused by moisture in the brake fluid) cause brake binding due to the pistons getting even slightly seized in the calliper. At best this will increase your gas consumption, and cause heat which could warp a disk. At worst it could seize enough to cause a crash. If the wheel does not spin freely, they need doing.

In my own opinion, brake fluid should be changed regularly, and 3 years would be the maximum I would go between changes (*Note: Most manuals suggest a 2 year replacement cycle for the brake fluid*). If you are going to change the fluid anyway, you may as well go the whole way and do this as well, as it is a relatively easy job. Often only cleaning is needed. If there were no leaks before, you can get away with re-using seals if they are not damaged. That is my opinion only. I've re-used seals in the past without problems. But if in doubt, fit new ones.

Finally, while you are doing this I thoroughly recommend fitting a hydraulic front brake stoplight switch. The OEM switch is not robust, and if it has not failed on a 25 year old bike yet, it will soon.

Special tools.

Brake bleed kit: Small plastic bottle and about 18" of clear plastic tube. Make a hole in the lid of the bottle for the tube to slide through.

Spacer: Piece of wood about 2" long and 1/2" thick.

Waste can: For the fluid to drain into. A tin can that will stay between the calliper mounts when forced in (if you have the wheel removed) is best as you don't need to stand it on anything. If the wheel is still in place you will need 2 cans and a couple of boxes for them to stand on each side of the wheel, so you can place the end of the hoses into while the fluid drains.

A Paper Clip: For removing seals and replacing dust cover.



For removing and replacing calipers see the two guides on [BikeCliff's website](#).
[Replacing Front Brake Pads](#)
[Replacing Rear Brake Pads](#)

Front Caliper(s)

The front calipers have 1 piston, the caliper block slides in the mounting bracket making a “brake sandwich” on the disk when the brake is applied.

First get some old sheets or other material and cover up the front wheel, fork legs, mudguard, etc, as much as possible, leaving only the caliper exposed to avoid splashing fluid on any paint, as brake fluid eats paint.

If you have twin disks, do the following for each caliper. Carefully, just minutely loosen the banjo where the hose attaches to the caliper and nip it up again. This is so you can easily undo it later when holding the caliper in one hand. It should be tight enough that no fluid escapes when the brake is applied.

Undo the two mounting bolts and draw the caliper off the disk. Remove the pads and the sprung plate at the back. Tie the caliper so it does not hang on the hoses and repeat for the other side. With both calipers removed position your waste can(s). See if you can push the piston back in with your fingers, or rotate it with a pipe tool.

Warning: Only use the pipe pliers on the very end of the piston, on the thin edge the other side of the groove where the dust cover fits, and then be very careful not to damage the metal.

Determine which caliper has the least seized piston (if there is one) and put your spacer in here where the pads go.

Holding the other caliper with the piston pointing upwards, gently pump the brake lever to push out the piston. Your spacer will stop the other piston from coming out completely. When the piston is free, pull it out and tip the brake fluid out of the calliper into your waste can. Undo the hose and put the hose (or both if you have anti-dive) into your waste can.

Remove hoses from the other side. For this one, loosen the bleed screw and tip any remaining fluid out of the hole where the hose went.



Take the calipers to the work bench. Remove the home made spacer from the caliper with the piston still in it and you should be able to wiggle the piston out, as it only should have about 2 – 3 mm left in the seal.

If you still can't get it out, see the tip in the rear caliper section.

Gently remove the dust covers. Put your index finger right inside so you can grip with your thumb and finger as near to the calliper body as possible, to avoid tearing it.

To remove the seals without damage, slide the rounded end of a paper clip between the seal and the metal. Gently ease a bit of the seal out of the metal and push down with your thumb.

Now you can see why the calipers gradually seize up over time. The build up of crud in the grooves behind the seal and the dust cover forces the rubber parts inwards reducing the tolerances. Thoroughly clean the grooves by scraping with a handy implement and finishing with some abrasive paper. Give the inside of the bore a clean up with the paper as well.



Thoroughly clean the pistons and polish with chrome cleaner. There may be some rust spots, which can be (very carefully) sanded with fine abrasive paper. If it feels smooth when you slide your nail over it its probably OK as long as it is around the piston. If there are scores going up and down the piston, it may be wise to replace it along with the seals. This was my worst one, and I decided to re-use it, (after confirmation from a friend who is a motor engineer).

Clean the seals and dust covers by spraying with penetrating oil, WD40, or similar and gently rubbing between your fingers. Get them good and wet for this. When clean, wash in soapy water and dry them.

Inspect the seals with a magnifying glass. If there are no scratch marks, nicks or other damage, they are good to go back in.

Thoroughly clean out the caliper body. Fit the seal first, then the dust cover. Liberally coat the inside of the bore, seal and lip of the dust cover with lubricant. I used some given to me by the aforementioned motor engineer specially formulated for brakes, but you can use brake fluid.



Straighten out the paper clip and bend about $\frac{1}{4}$ " of the end over to make an L shaped hook.

To fit the piston place it into the dust cover like this. Ensure the lip of the dust cover behind the piston is not folded underneath. Insert the paperclip hook between the rubber and the piston and gently move it around the piston so the lip of the dustcover comes out all around the it, at the same time moving the piston upright.



When it is positioned correctly, push the piston fully into the caliper. When it gets to the bottom, the lip of the dust cover should snap into its groove.

Refitting

Make sure all traces of old fluid have drained out of the hoses, and that the master cylinder reservoir is empty and cleaned. Use copper grease on the pad with the shim plate on both sides of the shim. With the caliper in place, reconnect the brake hoses.

Rear Caliper

Remove the pads as describes in BikeCliffs "Replacing Rear Pads Guide".

Remove the anchor bar from the caliper, and remove the caliper from the bike, but do not disconnect the hose.

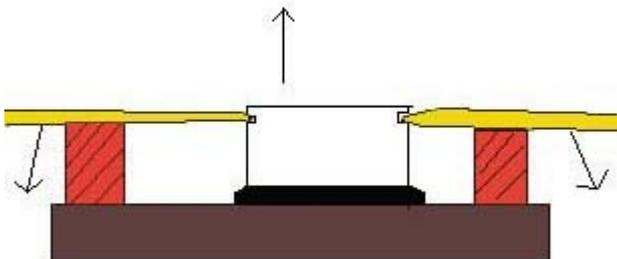
Remove the lid of the reservoir and making sure the reservoir does not fully empty, pump the brake until the two pistons meet.

Now disconnect the hose and put into the waste can. I tied a small bottle to the wheel adjuster for this.



TIP: If your front caliper piston (with the spacer) still will not come out, attach it to this hose, bleed out the air, and then pump it out fully.

On the bench, separate the two halves of the caliper by undoing the hexagon bolts. Be sure not to lose the small sealing washer between the two halves. The pistons can now be easily removed. If a bit stubborn, use two screwdrivers and 2 spacers to lever it out.



The caliper can now be cleaned up in the same way as the front ones, reassembled and put back on the bike.

If you are going to fit a hydraulic front brake stop switch, fit it where the two hoses leave the junction union underneath the bottom steering yoke. It replaces one of the banjo connectors, and you can get single and double banjo types. Use whichever one has the most clearance, which in my case was the double banjo side. For [bleeding the brakes see the guide on BikeCliff's website](#).